

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 March 2004 (25.03.2004)

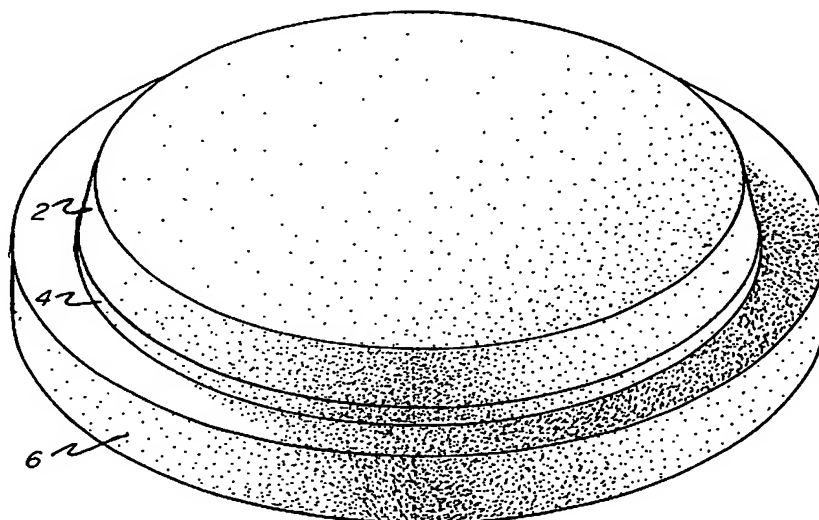
PCT

(10) International Publication Number  
WO 2004/024452 A2

- (51) International Patent Classification<sup>7</sup>: **B41J** 43123 (US). VALENT, Francis, S. [US/US]; 6023 Epernay Way, Galloway, OH 43119 (US). REGAN, Michael, J. [US/US]; 3210 NW Arrowood Circle, Corvallis, OR 97330 (US).
- (21) International Application Number: PCT/US2003/027145
- (22) International Filing Date: 27 August 2003 (27.08.2003) (74) Agent: PEACOCK, Bruce, E.; Wegman, Hessler & Vanderburg, 6055 Rockside Woods Boulevard, Suite 200, Cleveland, OH 44131 (US).
- (25) Filing Language: English
- (26) Publication Language: English (81) Designated States (*national*): JP, US.
- (30) Priority Data: 60/410,607 13 September 2002 (13.09.2002) US (84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- (71) Applicants (*for all designated States except US*): TOSOH SMD, INC. [US/US]; 3600 Gantz Road, Grove City, OH 43123 (US). HEWLETT-PACKARD CO. [US/US]; 1000 NE Circle Boulevard, Corvallis, OR 97330-4239 (US). Published:  
— without international search report and to be republished upon receipt of that report
- (72) Inventors; and  
(75) Inventors/Applicants (*for US only*): SMATHERS, David, B. [US/US]; 3298 Kirkham Road, Columbus, OH

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR MAKING DENSE MIXED METAL Si<sub>3</sub>N<sub>4</sub> TARGETS



(57) **Abstract:** A composition and method for fabricating high-density Ta-Al-O, Ta-Si-N, and W-Si-N sputtering targets, having particular usefulness for the sputtering of heater layers for ink jet printers. Compositions in accordance with the invention comprise a metal component, Si<sub>3</sub>N<sub>4</sub>, and a sintering aid so that the targets will successfully sputter without cracking, etc. The components are combined in powder form and pressure consolidated under heated conditions for a time sufficient to form a consolidated blend having an actual density of greater than about 95% of the theoretical density. The consolidated blend may then be machined so as to provide the final desired target shape.